

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
FACT SHEET

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NPDES Permit No.: GU0020222

PART I - STATUS OF PERMIT

Guam Waterworks Authority (hereinafter, the "permittee") has applied for renewal of its National Pollutant Discharge Elimination System (NPDES) permit pursuant to U.S. Environmental Protection Agency (EPA) regulations set forth in Title 40, Code of Federal Regulations (CFR), Part 122.21, for the discharge of treated effluent from its Agat-Santa Rita Wastewater Treatment Plant (Agat-Santa Rita WWTP) to the Tiplao Bay of the Philippine Sea. These regulations require any person who discharges or proposes to discharge pollutants from a point source into waters of the U.S. to submit a complete application for a NPDES permit, including renewal of a permit. Because the Territory of Guam (Guam) has not been delegated primary regulatory responsibility for administering the NPDES program, EPA is issuing a NPDES permit which incorporates both federal CWA and Guam water quality requirements. In accordance with 40 CFR 122.21(e), on September 19, 2005 the permittee submitted a complete application for renewal of its NPDES permit. The permittee is currently discharging to the Tiplao Bay under the NPDES Permit No. GU0020222, which became effective on April 16, 2001 and expired on April 15, 2006. Pursuant to 40 CFR 122.21, the terms of the existing permit are administratively extended until the issuance of a new permit.

PART II - DESCRIPTION OF FACILITY

The permittee owns and operates a municipal wastewater treatment facility located at Gaan Point, on the Island of Guam (Attachment A). The facility discharges treated domestic wastewater from the Agat-Santa Rita WWTP to the Tiplao Bay of the Philippine Sea. The WWTP outfall discharges within territorial waters of Guam.

The Agat-Santa Rita WWTP was built in 1972 and is a Class II wastewater treatment plant as defined under GEPA Water and Waste Water Regulations (September 25, 1978). The facility's basin consists of approximately 1,500 sewer connections. Attachment B provides a flow diagram of the general wastewater treatment process flow stream. The Agat-Santa Rita WWTP is a "package" plant that provides secondary treatment using a single train (no process redundancy

provided) contact stabilization process. The effluent from this treatment facility is sent through a combined outfall shared with the U.S. Navy's Apra Harbor Wastewater Treatment Plant, which is not part of the permittee's collection or treatment system, and the combined flow is discharged to the ocean through the Tupalao Bay outfall. The outfall terminates at a diffuser located approximately 1,600 feet from shore, at a depth of 125 feet. The following process data are provided in the October 2006 Guam Water Resources Master Plan (the "Master Plan") and by correspondence with GWA:

Liquid Stream:

- Raw influent passes through an approximately 1-inch opening, manually cleaned bar screen and is pumped via the influent pump station to the distribution chamber inlet box and contact basin;
- Mixed liquor from the re-aeration basin is mixed with the raw influent in the contact basin and is aerated prior to flowing to the secondary clarifier;
- The clarified effluent flows through the chlorine contact chamber to the effluent screens and pump station to Tupalao Bay outfall;
- Return sludge from the secondary clarifier is conveyed to the re-aeration basin by an airlift pump;

Solids Stream:

- Waste sludge from the secondary clarifier is transferred to the aerobic digester by the return activated sludge (RAS) airlift pump, stabilized, and thickened; and
- Thickened digested sludge is dried on the sludge drying beds and the dried solids are currently trucked to the Ordot Landfill for disposal.

According to the Master Plan, the facility has had a history of equipment or processes being out of service at various times over the years, including: the comminutor, sonic influent flow meter, secondary clarifier sludge scraper, chlorination system, and effluent flow meter. The facility currently does not chlorinate.

PART III - DESCRIPTION OF DISCHARGE AND RECEIVING WATER

During facility operations, the permittee discharges to the Tupalao Bay of the Philippine Sea at the following discharge point:

Discharge Point	Discharge Point Description	Effluent Description	Discharge Point Latitude	Discharge Point Longitude
001	Outfall from the Agat-Santa Rita WWTP	Secondary Treated Effluent (Non-disinfected)	13° 24' 48" N	144° 38' 30" E

Discharge Point No. 001 effluent is pumped through the Tupalao Outfall to Category M-2 (Good) receiving waters of Tupalao Bay of the Philippine Sea (Attachment A). This outfall also

discharges effluent from the U.S. Navy's Apra Harbor Wastewater Treatment Plant (NPDES Permit No. GU0110019).

The effluent discharged at Discharge Point No. 001 from the facility consists of treated sanitary wastewater that is regulated under an existing NPDES permit. Based on the application, the design flow for the facility is 0.75 million gallons per day (MGD). In DMRs submitted by the facility for 2005 through 2008, the permittee reported a maximum daily maximum flow rate of 9.81 MGD (August 2007) and a maximum monthly average flow of 2.39 MGD (September 2008). However, the facility has reported intermittent problems with the flow meter during this period, thus the accuracy of the flow data cannot be confirmed. Table 1 provides a summary of effluent limitations and discharge monitoring data from January 2005 to December 2008.

To protect the designated uses of waters of the U.S., Guam has adopted water quality standards ("GWQS") for surface waters depending on the level of protection required. The Tiplao Bay of the Philippine Sea is a territorial water of Guam and is classified as marine waters. The GWQS identify the protected uses for Category M-2 surface waters to include the following:

- Propagation and survival of marine life, particularly of shellfish and other similarly harvested aquatic organisms, coral, and reef-related resources;
- Whole body contact recreation;
- Mariculture activities; and
- Aesthetic enjoyment and related activities.

PART IV - DETERMINATION OF NUMERICAL EFFLUENT LIMITATIONS

The Clean Water Act (CWA) requires point source dischargers to control the amount of pollutants discharged to waters of the U.S. The control of pollutants is established through effluent limitations and other requirements in NPDES permits. When determining effluent limitations, EPA must consider limitations based on the technology used to treat the pollutant(s) (i.e., technology-based effluent limits) and protective of water quality standards (i.e., water quality-based effluent limits).

A. Applicable Technology-Based Effluent Limitations

EPA developed technology-based treatment standards for municipal wastewater treatment plants in accordance with Section 301(b)(1)(B) of the Clean Water Act. The minimum levels of effluent quality attainable by secondary treatment for Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), and pH, as defined in 40 CFR 133.102, are:

- BOD: 30 mg/L as a 30-day ("monthly") average,
45 mg/L as a 7-day ("weekly") average, and
85% removal efficiency;

Table 1 - Summary of Existing Effluent Limitations and Discharge Monitoring Data from January 2005 to September 2007 for Discharge Point No. 001 for the Agat-Santa Rita WWTP.

Parameter	Units ¹	Existing Permit Effluent Limitations			Discharge Monitoring Data			Monitoring Requirements	
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly	Highest Average Weekly	Highest Maximum Daily	Monitoring Frequency	Sample Type
Flow Rate	MGD	Monitoring Only	Monitoring Only	Monitoring Only	2.39	-- ²	9.8	Continuous	--
Biochemical Oxygen Demand (5-day)	mg/L	30	45	--	58	69	--	Weekly	24-hr Composite
	lbs/day	375	563	--	658	843	--		
	Percent Removal	Both the influent and the effluent shall be monitored. The arithmetic mean of the BOD values, by concentration, for effluent samples collected over a calendar month shall not exceed 15 percent of the arithmetic mean, by concentration, for influent samples collected at approximately the same times during the same period (85% BOD removal).			6-81% (min-max)	--	--		
Total Suspended Solids	mg/L	30	45	Monitoring Only	82	128	--	Weekly	24-hr Composite
	lbs/day	375	563	--	859	1401	--		
	Percent Removal	Both the influent and the effluent shall be monitored. The arithmetic mean of the TSS values, by concentration, for effluent samples collected over a calendar month shall not exceed 15 percent of the arithmetic mean, by concentration, for influent samples collected at approximately the same times during the same period (85% TSS Removal).			61.9-57.69% (min-max)	--	--		

Table 1 Continued - Summary of Existing Effluent Limitations and Discharge Monitoring Data from January 2005 to September 2007 for Discharge Point No. 001 for the Agat-Santa Rita WWTP.

Parameter	Units ¹	Existing Permit Effluent Limitations			Discharge Monitoring Data			Monitoring Requirements	
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly	Highest Average Weekly	Highest Maximum Daily	Monitoring Frequency	Sample Type
Fecal coliform	CFU/100 mL	200	400	--	12,773,105	2,419,200	--	Weekly	Discrete
Total Chlorine Residual ³	µg/L	7.5	--	12.3	Non-detect	--	Non-detect	Daily	Discrete
	lbs/day	0.094	--	0.154	--	--	--		
pH	Standard Units	Not < 6.0 nor > 9.0 SU at any time.			7.0 (minimum)	--	8.1 (maximum)	Weekly	Discrete
Enterococci ⁴	CFU/100 mL	35	--	57	1,064,558	--	2,419,200	Weekly	Discrete
Copper	ug/L	2.9	--	4.8	32	--	32	Monthly	24-hr Composite
	lbs/day	0.037	--	0.060	0.259	--	0.259		
Nickel	ug/L	8.2	--	13	8.2	--	8.2	Monthly	24-hr Composite
	lbs/day	0.103	--	0.169	0.064	--	0.064		
Zinc	ug/L	58	--	95	125	--	125	Monthly	24-hr Composite
	lbs/day	0.724	--	1.19	8.6	--	8.6		
Aluminum	ug/L	120	--	200	1,200	--	1,200	Monthly	24-hr Composite
	lbs/day	1.52	--	2.5	14.2	--	14.2		
Other Heavy Metals ⁵	µg/L or mg/L	Monitoring Only	--	Monitoring Only	--	--	--	Annually	24-hr Composite

Table 1 Continued - Summary of Existing Effluent Limitations and Discharge Monitoring Data from January 2005 to September 2007 for Discharge Point No. 001 for the Agat-Santa Rita WWTP.

Parameter	Units ¹	Existing Permit Effluent Limitations			Discharge Monitoring Data			Monitoring Requirements	
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly	Highest Average Weekly	Highest Maximum Daily	Monitoring Frequency	Sample Type
4,4-DDE	µg/L	Monitoring Only	--	Monitoring Only	Non-Detect	--	--	Monthly	24-hr Composite
4,4 DDD	µg/L	Monitoring Only	--	Monitoring Only	0.52	--	--	Monthly	24-hr Composite
Chlordane	µg/L	Monitoring Only	--	Monitoring Only	0.69	--	--	Monthly	24-hr Composite
Dieldrin	ug/l	Monitoring Only	--	Monitoring Only	Non-detect	--	--	Monthly	24-hr Composite
Pesticides ⁶	µg/L or mg/L	Monitoring Only	--	Monitoring Only	--	--	--	Annually	24-hr Composite
Ammonia-Total	µg /L	Monitoring Only	--	Monitoring Only	14.88	--	21.9	Weekly	24-hr Composite
	lbs/day	--	--	--	73	--	88		
Oil and Grease	mg/L	Monitoring Only	--	Monitoring Only	32.4	--	32.4	Monthly	Discrete
	lbs/day	--	--	--	423	--	423		
Whole Effluent Toxicity	TU _C	Monitoring Only	--	Monitoring Only	--	--	32.3	Quarterly	24-hr Composite

¹ Mass limitations based on an annual average daily design flow of 1.5 MGD

² Not applicable or data not available for review

³ Contact time following chlorination and prior to effluent discharge shall not be less than 15 minutes

⁴ To determine compliance, a minimum of four (4) samples must be collected at approximately equal intervals; reported as colony forming units (CFU) per 100 mL

⁵ Heavy metals include: As, Cd, Cr³⁺, Cr⁶⁺, Cu, Pb, Hg, Ni, Ag, and Zn, and shall be monitored for both total recoverable and dissolved metal

⁶ For the listing of all pesticides (organochlorines, organophosphates, carbamates, herbicides, fungicides, defoliants, and botanicals) see EPA Water Quality Criteria *Blue Book*

- TSS: 30 mg/L as a 30-day ("monthly") average, 45 mg/L as a 7-day ("weekly") average, and 85% removal rate efficiency;
- pH: must range from 6.0 – 9.0 standard units as an instantaneous maximum

In accordance with 40 CFR 133, technology-based effluent limitations are proposed for BOD, TSS, and pH based on secondary treatment requirements for municipal wastewater treatment facilities. These requirements are performance-based and represent the degree of effluent reduction achievable using available wastewater treatment technology. In conjunction with federal requirements, Section 5104 of GWQS provides secondary treatment requirements that describe the minimum level of effluent quality to be attained when secondary treatment is required. Table 2 provides a summary of proposed technology-based effluent limitations for Discharge Point No. 001.

1. **Biochemical Oxygen Demand.** Pursuant to 40 CFR 133.102 and GWQS Section 5104(A)(7)(a), effluent limitations are proposed for BOD. Secondary treatment requirements provide that effluent concentrations of BOD shall not exceed 30 mg/L on a 30-day average and not exceed 45 mg/L based on a 7-day average. In addition, the 30-day average percent removal shall not be less than 85 percent. Therefore, EPA proposes an average monthly limitation of 30 mg/L and average weekly limitation of 45 mg/l; and the 30-day average percent BOD removal shall not be less than 85 percent. Based on the facility's design flow of 0.75 MGD, EPA also proposes a mass-based weekly average effluent limitation of 282 lbs/day, and a monthly average effluent limitation of 188 lbs/day for BOD.
2. **Total Suspended Solids.** Pursuant to 40 CFR 133.102 and GWQS Section 5104 (A)(7)(b), effluent limitations are proposed for TSS. Secondary treatment requirements provide that effluent concentrations of TSS shall not exceed 30 mg/L on a 30-day average and 45 mg/L on 7-day average. In addition, the 30-day average percent removal shall not be less than 85 percent. Therefore, EPA proposes an average monthly limitation of 30 mg/L and average weekly limitation of 45 mg/l; and that the 30-day average percent BOD removal shall not be less than 85 percent. Based on the facility's design flow of 0.75 MGD, EPA also proposes a mass-based weekly average effluent limit of 282 lbs/day, and a monthly average effluent limitation of 188 lbs/day for TSS.
3. **Fecal Coliform.** GWQS Section 5104 (A)(7)(c) provides secondary treatment requirements for bacteria. GWQS provide that the arithmetic mean of the fecal coliform values for effluent samples collected over a period of 30 consecutive days shall not exceed 200 colony forming units (CFU) per 100 mL, and the arithmetic mean values for the effluent samples collected over a period of seven consecutive days shall not exceed 400 CFU per 100 mL. In addition to these technology-based standards, GWQS also provide receiving water quality standards for bacteria based on enterococci for M-2 marine waters. Fecal coliform and enterococci are used as indicators to estimate the presence of pathogens. The existing permit established technology-based effluent limits for fecal coliforms based on secondary

treatment requirements for bacteria, and water quality-based limits for enterococci. (See Section IV.B.3.i for the discussion of water-quality-based microbiological permit limits). The facility has consistently failed to comply with its fecal coliform limit, most easily explained by the facility's lack of chlorination, with an average count in excess of three orders of magnitude greater than permit limits. Because fecal coliform standards are performance-based requirements for secondary treatment facilities and should the facility establish a disinfection system during the permit term, EPA proposes effluent limitations for fecal coliform in the draft permit as an indicator to determine the effectiveness of the facility's disinfection system.

4. **pH.** 40 CFR 133.102(c) and GWQS Section 5104 (A)(7)(d) provide secondary treatment requirements for pH that state effluent values for pH shall be maintained within the limits of 6.0 and 9.0 standard units. The existing permit established pH effluent limits between 6.5 to 8.5 standard units based on GWQS, which are more stringent than the required treatment performance standard. Based on effluent monitoring data, pH values ranged between 7.0 and 8.1 standard units. Therefore, since the facility has been consistently operating at the required level established in the existing permit, EPA proposes to retain effluent limitations for pH of 6.5 to 8.5 standard units in the draft permit.
5. **Oil and Grease.** EPA considers Oil & Grease (O&G) as a conventional pollutant pursuant to §304(a)(4) of the CWA and 40 CFR 401.16. O&G is commonly found in all domestic wastewater. Section 5103.C.10 of GWQS provides narrative water quality standards that state: (1) that all waters shall be free from substances, conditions or combinations attributable to domestic discharges that cause visible floating materials, debris, oils, grease, scum, foam or other floating matter which degrade water quality or use; (2) O&G shall not cause damage to fish, invertebrates or objectionable degradation of drinking water quality; or (3) O&G shall not form an oil deposit on the shores or bottom of the receiving water body.

Based on 2005 to 2008 DMR data for O&G, EPA observed erratic and high O&G effluent concentrations. Since GWQS does not provide a numeric water quality standard for oil and grease, EPA proposes numerical effluent limitations for oil and grease based on EPA's Best Professional Judgment (BPJ) since (1) there are no applicable effluent limitation guidelines and performance standards for oil and grease for POTWs, and (2) similar domestic wastewater treatment facilities have shown a maximum daily limit of 15 mg/l and an average monthly limit of 10 mg/l is achievable. Section 402(a)(1) of the CWA gives EPA authority to implement BPJ-based effluent limits when effluent limitation guidelines and performance standards are not available for a pollutant of concern.

Thus, EPA proposes a maximum daily limitation (MDL) of 15 mg/l and an average monthly limitation (AML) of 10 mg/L for oil and grease. These numerical limits were proposed by EPA by the "Oil and Grease Limitations for Petroleum Marketing Terminals" memorandum dated March 18, 1974. The memo provides guidance on implementing numerical effluent limits and managing and controlling O&G in Petroleum Marketing Terminals. From the memo, EPA determined that the AML and

MDL values are adequate thresholds to control visible sheening and other undesirable visible characteristics in the receiving waters caused by O&G collection. EPA is convinced that well-operated secondary-level domestic wastewater treatment is capable of removing O&G at the proposed limits. EPA concluded that these are reasonable values to uphold Guam's O&G water quality criteria. To assist in meeting these numerical values, EPA requires proper removal and disposal of oil and grease from upstream sources and proper operation and maintenance of the collection system to minimize plugging from oil and grease.

Based on the facility's design flow of 0.75 MGD, EPA proposes a mass-based maximum daily effluent limitation of 94 lbs/day, and a monthly average effluent limitation of 62.6 lbs/day. In addition to the technology-based effluent limits, narrative water quality-based limits for oil and grease (GWQS Section 5103.C.10), such as prohibiting visible sheening, are proposed in the draft permit.

6. Compliance with Federal Anti-Backsliding Regulations and Guam's Antidegradation Policy for Proposed Technology-based Effluent Limitations.

Section 402(o) of the CWA prohibits the renewal or reissuance of an existing NPDES permit that contains technology-based effluent limits that are less stringent than those established in the previous permit, except as provided in 40 CFR 122.44(l). This is referred to as "anti-backsliding." The draft permit establishes technology-based effluent limitations for BOD, TSS, fecal coliform, and pH that are as stringent as or more stringent than those in the existing permit; therefore, anti-backsliding regulations do not apply. Also, the design flow of this facility is not increased, thus anti-degradation regulations likewise do not apply.

Table 2 - Summary of Proposed Technology-Based Effluent Limitations for Discharge Point No. 001 for the Agat-Santa Rita WWTP.

Parameter	Units ¹	Proposed Technology-Based Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Biochemical Oxygen Demand (5-day)	mg/L	30	45	-- ²	--	--
	lbs/day	375	563	--	--	--
	Both the influent and the effluent shall be monitored. The arithmetic mean of the BOD values, by concentration, for effluent samples collected over a calendar month shall not exceed 15 percent of the arithmetic mean, by concentration, for influent samples collected at approximately the same times during the same period. The 30-day average percent removal shall not be less than 85 percent.					

Parameter	Units ¹	Proposed Technology-Based Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Total Suspended Solids	mg/L	30	45	--	--	--
	lbs/day	375	563	--	--	--
	Both the influent and the effluent shall be monitored. The arithmetic mean of the TSS values, by concentration, for effluent samples collected over a calendar month shall not exceed 15 percent of the arithmetic mean, by concentration, for influent samples collected at approximately the same times during the same period. The 30-day average percent removal shall not be less than 85 percent.					
Oil and Grease	mg/L	10	--	15	--	--
	lbs/day	125	--	188	--	--
Fecal Coliform	CFU/100 mL	200	400	--	--	--
pH	Std. Units	--	--	--	6.5	8.5 ³

¹ Mass-based limits based on design flow of 0.75 MGD

² Not applicable

³ The technology-based upper limit for pH is 9.0 SU. However, proposed permit limit is based on the more stringent water quality limit of pH 6.5 – 8.5; see discussion below.

B. Water Quality-Based Effluent Limitations (WQBELs)

Pursuant to 40 CFR 122.44(d)(1), water quality-based effluent limitations, or WQBELS, are required in NPDES permits when the permitting authority determines that a discharge causes, has the reasonable potential to cause, or contributes to an excursion above any water quality standard. Applicable water quality standards are established in GWQS, which incorporated section 304(a) federal water quality criteria. Revisions to these standards were adopted by the Guam Environmental Protection Agency (GEPA) on May 17, 2002. These standards were subsequently approved by EPA.

1. Determining the Need for WQBELs. When determining whether an effluent discharge causes, has the reasonable potential to cause, or contributes to an excursion above narrative or numeric criteria within State (or Territory) water quality standards, the permitting authority uses procedures which account for existing controls on point and nonpoint sources of pollution, and the variability of the pollutant or parameter in the effluent, the sensitivity of species to toxicity testing, and, where appropriate, dilution of the effluent in the receiving water. EPA conducted a Reasonable Potential Analysis (RPA) for each monitored pollutant or parameter in the effluent, except BOD, TSS, and pH. The RPA was based on procedures outlined in EPA's *Technical Support Document for Water Quality-based Toxics Control* (March 1991) herein after referred to as the TSD. These procedures require using the maximum daily effluent concentration (MEC) from discharge monitoring data. A computer-aided RPA program known as the Reasonable Potential Calculator v2.0 (RPcalc) assisted in the statistical determination of critical value reasonable potential. All non-detect values were assigned half of its MDL value as described by current censored data literature

(Antweiler and Taylor, 2008) Available receiving water data from reference and onshore stations were considered in assessing reasonable potential.

2. Section 5104(C), (D), and (E) of the GWQS provide for the application of alternate standards within an area surrounding the discharge point, or zone of mixing, when it is not feasible to achieve an effluent quality that meets water quality standards at the point of discharge (i.e., end of the pipe). GEPA approved zone of mixing for specific pollutants in this discharge in 2001, thus for conducting RPAs, dilution credits or mixing zones were applied on a pollutant-by-pollutant basis. Pollutants not considered for dilution are copper, aluminum, zinc, and nickel. EPA applied 82:1 dilution credit to the remaining permitted pollutants as explicitly allowed from GEPA's ZOM approval letter to Apra Harbor (Navy), filed jointly with Agat-Santa Rita.

EPA reviewed DMRs submitted by the permittee from October 2005 to December 2008 and identified MECs. MECs are used to statistically determine a statistical critical discharge value and then are used to compare directly to the applicable water quality standard or criterion. If the critical discharge value is greater than the applicable standard or criterion, the pollutant has a reasonable potential for violating its water quality standard or criterion. Table 3 provides the inputs and summary of RPA for each pollutant or parameter that causes, has the reasonable potential to cause, or contributes to an excursion above GWQS.

- a. **Copper.** Section 5103(C)(11)(B)(i) of the GWQS provide that in M-2 waters, copper shall not exceed 4.8 µg/L as a Criterion Maximum Concentration (CMC) or 3.1 µg/L as a Criterion Chronic Concentration(CCC). Based on DMR data, the MEC is 32 µg/L (March 2006) for copper. EPA conducted a reasonable potential analysis using DMR nickel effluent from October 2005 to December 2008. Using the CCC water quality criterion, EPA has determined the discharge does have a reasonable potential to cause, or contributes to an exceedance of GWQS for copper.
- b. **Nickel.** Section 5103(C)(11)(B)(i) of the GWQS provide that in M-2 waters, nickel shall not exceed 74 ug/L as a CMC, 8.2 µg/L as a CCC, or 4,600 µg/L for organism-only consumption. Based on DMR data, the MEC is 8.2 µg/L (March, 2006) for nickel. EPA conducted a reasonable potential analysis using DMR nickel effluent from October 2005 to December 2008. Using the CCC water quality criterion, EPA has determined the discharge does not have a reasonable potential to cause, or contributes to an exceedance of GWQS for nickel. Therefore, permit average monthly and maximum daily limits for nickel will remain as from the previous permit.
- c. **Zinc.** Section 5103(C)(11)(B)(i) of the GWQS provide that in M-2 waters, zinc shall not exceed 95 µg/L as a CMC, 86 µg/L as a CCC, or 69,000 µg/L for human consumption of food only. Based on DMR data, the MEC is 125 µg/L (March 2006) for zinc. EPA conducted a reasonable potential analysis using DMR nickel effluent from October 2005 to December 2008. Using the CCC water quality criterion, EPA has determined the discharge does have a reasonable potential to cause, or contributes to an exceedance of GWQS for zinc. Using the CCC water

quality criterion, EPA has determined the discharge has a reasonable potential to cause, or contributes to an exceedance of GWQS for zinc.

- d. Aluminum.** Section 5103(C)(11) of GWQS provides that all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological, acute or chronic responses in human, plant, animal or aquatic life. Section 5103(C)(11)(B)(i) of GWQS provides that Appendix A contains Table IV of additional (non-priority) toxic pollutants with maximum numerical limits that apply to marine and fresh waters of Guam. For marine waters, Table IV establishes a maximum limit for aluminum as 200 µg/L. Based on DMR data, the MEC for aluminum is 1,200 µg/L (March 2006). Using the aluminum maximum numerical limit for marine waters, EPA has determined the discharge has a reasonable potential to cause, or contributes to an exceedance of GWQS for aluminum.
- e. Ammonia.** Section 5103(C)(11) of GWQS provides that all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological, acute or chronic responses in human, plant, animal or aquatic life. Section 5103(C)(11)(B)(i) of GWQS provides that Appendix A contains Table IV of additional (non-priority) toxic pollutants that have maximum numerical limits that apply to all waters of Guam. For marine waters, Table IV establishes a maximum water quality criterion for ammonia in marine waters as 20 µg/L. EPA interpret this criterion as unionized ammonia (UIA), the toxic form of ammonia. According to DMR data, the discharger has reported ammonia as total ammonia (unionized-NH₃ and ionized-NH₄⁺). As a result, EPA had to convert submitted total ammonia data to UIA concentrations by using the Ambient Water Quality Criteria for Ammonia (Saltwater)-1989 for effluent data and the 1999 Update of Ambient Water Quality Criteria for Ammonia for receiving water data. The documents provide guidance on ammonia speciation and the conversion from total ammonia to UIA for freshwater and saltwater systems. The conversion to UIA allows consistency with Guam Water Quality Standard numeric criterion for ammonia, expressed as UIA, as a toxic pollutant in marine waters for collected field expressed as total ammonia. EPA used available pH, temperature, and salinity data from collected effluent and receiving water samples to adjust for UIA.

The critical ambient concentration value for receiving water, represented at Station TS-3, for total ammonia is 0.05 mg/L NH₃-N (November 2008). Effluent MEC for total ammonia is 21.9 mg/L (February 2007). Based on recent receiving water monitoring data for Tiplao Bay collected by the U.S. Navy for their Apra Harbor WWTP monitoring program and assumed a general salinity of 30 g/kg, EPA calculated an average temperature of 29.6 degree Celsius and a pH of 7.2. And based on provided effluent monitoring data for Agat, EPA calculated an average effluent temperature of 26.4 degree Celsius and an average effluent pH of 7.3. Based on DMR data, the MEC is 0.249 mg/l UIA, converted from 21.9 mg/l total ammonia. EPA conducted a reasonable potential analysis using DMR total ammonia from October 2005 to December 2008. Using the ammonia as a toxic for marine waters criterion and the allotted dilution credit, EPA has determined

the discharge does not have a reasonable potential to cause, or contributes to an exceedance of GWQS for ammonia as a toxic

- f. Chlordane.** Section 5103(C)(11) of GWQS provides that all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological, acute or chronic responses in human, plant, animal or aquatic life. Appendix A subsection I contains a list of 126 priority toxic pollutants designated under Section 307(a) of the CWA and subsection III provides numerical criteria for these priority toxic pollutants. For saltwater, GWQS provide that chlordane shall not exceed 0.09 µg/L as a CMC, 0.004 µg/L as a CCC, or 0.0022 µg/L for human health protection (consumption of water and food). Based on DMR data, the MEC is 0.69 µg/L (December 2007) for chlordane. EPA conducted a reasonable potential analysis using DMR chlordane effluent from October 2005 to December 2008. Using the human health water quality criterion and applying the allowable dilution, EPA has determined the discharge does have a reasonable potential to cause, or contributes to an exceedance of GWQS for chlordane.
- g. Total Chlorine Residual.** Section 5103(C)(11) of GWQS provides that all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological, acute or chronic responses in human, plant, animal or aquatic life. Chlorine is known to be toxic to aquatic life. The existing permit established effluent limitations for total chlorine residual. The permittee does not currently have the capability to operate a disinfection system that would use chlorine. However, in the event that the facility should upgrade its treatment system, EPA has determined that the discharge would have a reasonable potential to cause, or contributes to an exceedance of GWQS for chlorine.
- h. Whole Effluent Toxicity.** Pursuant to 40 CFR 122.2, whole effluent toxicity (WET) is defined as the aggregate toxic effect of an effluent measured directly by a toxicity test. Two types of WET tests are acute and chronic. An acute test is conducted over a shorter time period and measures mortality. A chronic test measures sublethal effects (e.g., reproduction and/or growth). GWQS provide narrative water quality criteria prohibiting discharges that "...injure or are toxic or harmful to humans, animals, plants, or aquatic life" (Section 5103(A)(1)(d) of GWQS). GWQS Sections 5103(C)(11)(A)(i) through (C)(11)(A)(iv) address general requirements for toxic substances. These requirements are often referred to as "no toxics in toxic amounts." The existing permit requires quarterly chronic toxicity testing using the sea urchin, *Strongylcentrotus purpuratus*, or sand dollar, *Dendraster excentricus*.

WET data have been provided by the permittee. Based on DMR data from December 2005 to December 2008, GWA reported a WET value of 26 TU_c for one of the quarterly monitoring events: September 2006, and 32.26 TU_c was reported for three quarterly monitoring events: June, 2008; September, 2008; December 2008; and September, 2006. As specified in section 3.3 of EPA's TSD, EPA recommends that in the absence of a numeric criterion for the parameter toxicity, a CCC of 1.0 TU_c be used to ensure the protection against chronic toxicity in the receiving water. However, based on an assumed approved mixing

zone dilution of 82:1 for chronic toxicity, the existing permit established a median monthly effluent trigger of 83 TU_c or a maximum daily effluent trigger of 133 TU_c.

EPA has determined that the discharge does have a reasonable potential to exceed the median monthly chronic toxicity trigger. Therefore, EPA proposes to continue quarterly chronic toxicity monitoring with numeric chronic effluent limits, and to establish chronic toxicity effluent limits.

Table 3 – Summary of Reasonable Potential Analysis for Discharge Point No. 001 for the Agat-Santa Rita WWTP.

Parameter	Units	Max. Effluent Concentration	N	Water Quality Standard/Toxicity Trigger*	Demonstrates Reasonable Potential?
Copper	µg/L	32	33	3.1	Y
Nickel	µg/L	8.2	33	8.2	N
Zinc	µg/L	125	34	95	Y
Aluminum	µg/L	1,200	34	200	Y
Ammonia - Acute	µg/L	22	32	1,200	N
Chlordane	µg/L	0.69	32	2.2 x 10 ⁻³	Y
Toxicity-Chronic*	TU _c	32.3	32	83	Y

Application of Mixing Zones and Dilution Credits. The CWA directs States (and Territories) to adopt water quality standards which include the designation of uses and criteria to protect those uses. Pursuant to 40 CFR 131.13, States (and Territories) also are authorized to adopt general policies, such as mixing zones, to implement State water quality standards. Section 5103(C), (D), and (E) of GWQS allow the use of mixing zones for dischargers that would otherwise exceed water quality criteria for aquatic life, human health, and other water quality criteria at the point of discharge (i.e., end of the pipe).

- Zones of mixing are granted by the GEPA upon review and approval of an Environmental Impact Statement and concurrence of EPA.
- The zone of mixing shall be limited to an area that will minimize impacts on uses, and where allowed, will not adversely affect the receiving water's designated uses.

- Water quality limits will be established if effluent limitations are revised within the mixing zone.
- Water quality standards must be met at every point outside the zone of mixing.
- Mixing zones are not allowed in usage categories M-1 and S-1.
- Zones of passage must be allowed, and mixing zones must not encroach upon areas used for fish harvesting, particularly of stationary species.
- Biologically important areas and habitat for endangered and threatened species must be protected.
- Mixing zones shall not cause lethal conditions to aquatic life and wildlife passing through the zone or be injurious to human health from temporary exposure.

On **January 30, 2009**, the permittee submitted a request to Guam EPA for a larger mixing zone of 115:1. EPA did not take the dilution credit request into consideration. When a new mixing zone is approved by GEPA prior to or after the final issuance of the permit, EPA will consider the allowed dilution factor as appropriate when establishing final WQBELs or permit effluent triggers. In the interim, EPA will carry over the allowed dilution of 82:1 for approved permitted pollutants as specified in the 14 February 2001 Mixing Zone Approval letter from GEPA.

- 3. Establishing WQBELs.** In accordance with 40 CFR 122.44(d), the draft permit proposes WQBELs for several pollutants or parameters since EPA has determined, based on effluent data provided by the permittee and the nature of the discharge, that the effluent discharged from the facility causes, has the reasonable potential to cause, or contributes to an exceedance of GWQS. EPA has determined that effluent from the Agat-Santa Rita WWTP, when discharged through Discharge Point No. 001, demonstrates reasonable potential to exceed water quality standards for copper, zinc, aluminum, and chronic toxicity.

WQBELs for water quality-limited pollutants can include consideration of background (ambient) pollutant concentrations, determined at the reference site. Waste load allocation (WLA) is the maximum allowable pollutant concentration from a discharger's effluent that, after accounting for available dilution under critical conditions, will meet an applicable water quality standards or criteria. The WLAs derived below considered background levels of pollutants if data was made available to EPA. And EPA assumed a minimum probable current flow of zero for ambient receiving water current conditions in Tipalao Bay.

EPA recommends the use of a permit limit derivation procedure for WQBELs where the acute, chronic, and human health WLAs are statistically translated into a Maximum Daily Limit (MDEL) and/or Average Monthly Limit (AML) based on the more stringent acute, chronic, or human health WLA (section 5.4.1 of EPA's TSD). As described in section 5.2.2 of EPA's TSD, WQBELs for NPDES dischargers are established based on the need to maintain effluent quality for a pollutant at a level that will comply with water quality standards even during critical conditions in the

receiving water. This level is determined by the WLA for the particular pollutant. The WLA, in turn, dictates the necessary treatment performance level for the pollutant through the calculation of a long-term average (LTA) to ensure that the WLA is met under critical conditions over a long-term period.

In the draft permit, calculations of permit limitations are based on statistical procedures outlined in section 5.4.1 and 5.4.4 of EPA's TSD and are expressed as a Maximum Daily Limitation (MDL) or Average Monthly Limitation (AML). Mass-based MDLs and AMLs were both calculated based on the design flow of 0.75 MGD. Attachment C provides an example of the permit limit derivation procedure for this discharge.

For all reissued permits, section 402(o) of the CWA and 40 CFR 122.44(l) require permit conditions to be as stringent as the existing permit unless specific exceptions apply. The draft permit contains no specific exceptions for WQBELs. The derivation of each WQBEL is described in sections 3.a. through 3.i. (including Tables 4 through 8). Table 9 provides a summary of all WQBELs, monitoring frequency, and sample types for each pollutant or parameter in the draft permit that demonstrated reasonable potential to cause, or contribute to an exceedance of GWQS.

- a. **pH.** Sections 5103(C)(2) of the GWQS provide that the pH for category M-2 waters of the Tipalao Bay of the Philippine Sea shall be between 6.5 to 8.5 and should not vary more than 0.2 units from the naturally occurring variation due to the discharge. The existing permit established a permit limitation for pH of between 6.5 to 8.5 standard units. Based on DMR data, all reported values for pH meet these limits. Thus the facility appears to be in compliance with the more stringent requirements of the existing permit and the existing limit of 6.5 to 8.5 is retained as the final effluent limit in the draft permit.
- b. **Copper.** Details for the WQBEL calculations and final effluent limitations for copper are provided in Table 4. EPA calculated concentration-based WQBELs for both acute and chronic standards. The acute Long-Term Average (LTA) was the more stringent and resulted in an MDL and AML for copper of 4.8 µg/L and 2.20 µg/L, respectively. EPA also proposes a mass-based MDL and AML of 0.03 lbs/day and 0.014 lbs/day, respectively.
- c. **Zinc.** Details of the WQBEL calculations and final effluent limitations for nickel are provided in Table 6. The chronic standard was the more stringent and resulted in an MDL and AML of 95.0 µg/L and 45.8 µg/L for zinc as the MDL and AML, respectively. In addition, EPA proposes a mass-based MDL and AML of 0.6 and 0.3 lbs/day.
- d. **Chlordane.** Details of the WQBEL calculations and final effluent limitations for chlordane are provided in Table 5. EPA calculated concentration-based WQBELs for acute, chronic, and human health-[consumption of] organism only standards and incorporated the currently approved dilution. The human health AML was the most stringent and resulted in an MDL and AML for chlordane of 0.320 µg/L and 0.182 µg/L, respectively. EPA also proposes a mass-based MDL and AML of 2.00×10^{-3} and 1.14×10^{-3} lbs/day, respectively.

- e. Aluminum.** Details of the WQBEL calculations and final effluent limitations for aluminum are provided in Table 7. EPA calculated concentration-based WQBELs of 362 µg/L and 148 µg/L for aluminum as the MDL and AML, respectively. Since these values are less stringent than the existing permit limits, no changes to the limits are made.
- f. Chronic Toxicity** Details of the permit limit calculations limitations for chronic toxicity are provided in Table 5. EPA calculated numeric-based toxicity limits for chronic toxicity and incorporated allowed dilution. The use of the submitted No Observable Effect Concentration (NOEC) endpoint value of 32.6 TUc resulted in an MDL and AML for chlordane of 0.185 µg/L and 0.076 µg/L, respectively. EPA also proposes a mass-based MDL and AML of 1.16×10^{-2} and 4.8×10^{-4} lbs/day, respectively.

Table 4 - WQBEL Calculations for Copper.

	Acute ¹	Chronic ¹
Water Quality Criterion, µg/L	4.8	3.1
No Dilution Credit Authorized	0	0
Background Concentration, µg/L	127.8	127.8
WLA, µg/L	4.8	3.1
WLA Multiplier (99 th %)	0.274	0.472
LTA, µg/L	1.32	1.46
LTA _{MDL} Multiplier (99 th %)	3.64	--
MDL, µg/L	4.8	--
MDL, lbs/day	0.030	--
LTA _{AML} Multiplier (95 th %) ¹	1.67	--
AML, µg/L	2.20	--
AML, lbs/day	0.014	--

¹Derivation of permit limit based on Section 5.4.1 of EPA's TSD

Table 5 - WQBEL Calculations for Zinc.

	Acute¹	Chronic¹
Water Quality Criterion, µg/L	95	86
No Dilution Credit Authorized	0	0
Background Concentration, µg/L	113	113
WLA, µg/L	95	86
WLA Multiplier (99 th %)	0.303	0.527
LTA, µg/L	28.8	45.4
LTA _{MDL} Multiplier (99 th %)	3.30	-
MDL, µg/L	95.0	-
MDL, lbs/day	0.6	-
LTA _{AML} Multiplier (95 th %) ¹	1.59	-
AML, µg/L	45.8	-
AML, lbs/day	0.29	-

¹Derivation of permit limit based on Section 5.4.1 of EPA's TSD

Table 6 - WQBEL Calculations for Chlordane

	Acute¹	Chronic¹	Human Health – Organism Only¹
Water Quality Criterion, µg/L	0.09	0.004	2.22×10^{-3}
Allowed Dilution Credit	82	82	82
Background Concentration, µg/L	0	0	0
WLA, µg/L	7.38	0.328	0.182
WLA Multiplier (99 th %)	0.122	0.216	---
LTA, µg/L	0.900	0.008	---
LTA _{MDL} Multiplier (99 th %)	8.19	3.55	---
MDL, µg/L	7.46	0.580	0.182
MDL, lbs/day	4.67×10^{-2}	3.67×10^{-2}	1.14×10^{-3}
LTA _{AML} Multiplier (95 th %) ¹	-	-	1.76
AML, µg/L	-	-	0.320
AML, lbs/day	-	-	2.00×10^{-3}

¹Derivation of permit limit based on Section 5.4.1 of EPA's TSD

Table 7 - WQBEL Calculations for Aluminum.

	Criterion¹
Water Quality Criterion, µg/L	200
No Dilution Credit Authorized	0
Background Concentration, µg/L	450
WLA, µg/L	200
WLA Multiplier (99 th %)	0.393
LTA, µg/L	79
LTA _{MDL} Multiplier (99 th %)	4.61
MDL, µg/L	362
MDL, lbs/day	2.3
LTA _{AML} Multiplier (95 th %) ¹	1.88
AML, µg/L	148
AML, lbs/day	0.9

¹Derivation of permit limit based on Section 5.4.1 of EPA's TSD

Table 7 - WQBEL Calculations for Aluminum.

	Criterion ¹
Water Quality Criterion, µg/L	200
No Dilution Credit Authorized	0
Background Concentration, µg/L	450
WLA, µg/L	200
WLA Multiplier (99 th %)	0.393
LTA, µg/L	79
LTA _{MDL} Multiplier (99 th %)	4.61
MDL, µg/L	362
MDL, lbs/day	2.3
LTA _{AML} Multiplier (95 th %) ¹	1.88
AML, µg/L	148
AML, lbs/day	0.9

¹Derivation of permit limit based on Section 5.4.1 of EPA's TSD

- f. Total Chlorine Residual.** The existing permit establishes numeric effluent limitations for total chlorine residual. The existing permit establishes an MDL and AML of 12.3 and 7.5 ug/L, respectively. The existing permit also establishes mass-based effluent limitations of 0.154 and 0.094 lbs/day for the MDL and AML, respectively. Section 5103(C)(11)(B)(i) of GWQS provides that Appendix A contains Table IV of additional (non-priority) toxic pollutants that apply to all waters of Guam. For marine water, the maximum numeric limit for chlorine (total residual) is 7.5 ug/l. In addition, EPA's National Recommended Water Quality Criterion for Non-priority Pollutants for chlorine in saltwater is a CMC of 13 ug/l and a CCC of 7.5 ug/l. As a result, EPA proposes concentration-based WQBELs of 12.3 and 7.5 ug/L, as the MDL and AML, respectively; and the mass-based loading WQBELs of 0.08 and 0.04 lbs/day for the MDL and AML, respectively. However, since the facility does not currently disinfect the effluent using chlorine but may have the capability to do so during the permit term, effluent limits for total residual chlorine only become effective upon operation of a chlorination/dechlorination system. However, if the permittee decides to implement disinfection by chlorination, the permittee must notify EPA before commencing disinfection.
- g. Whole Effluent Toxicity.** Section 5103 of GWQS provides narrative toxicity requirements that limit the adverse effects of toxic substances in effluents. The

existing permit requires quarterly chronic toxicity testing using the sea urchin, *Strongylcentrotus purpuratus*, or sand dollar, *Dendraster excentricus*. For the draft permit EPA proposes annual chronic toxicity monitoring with numeric triggers. Based on reasonable potential analysis, EPA proposes numeric limits based on the current approved mixing zone for chronic toxicity, therefore dilution credit of 82:1 was given. For this discharge, the chronic WET permit limits are any one test result greater than 69 TU_c (during the monthly reporting period), or any one or more test rests with a calculated median value greater than 138 TU_c (during the monthly reporting period). EPA will require the permittee to conduct quarterly chronic toxicity testing using the same species as currently used for the existing permit and will include toxicity limits that, if exceeded, result in additional, accelerated effluent toxicity testing. EPA can adjust chronic toxicity limits for dilution to account for a changed and approved dilution factor by Guam EPA.

- h. Enterococci.** Section 5103(C)(1)(b) of the GWQS provides microbiological requirements for surface waters. For water bodies classified as M-2 waters, GWQS provide that enterococci shall be no greater than 35 CFU/100 mL based on the geometric mean of five sequential samples taken over a 30-day period, nor shall any instantaneous reading exceed 104 CFU/100 mL. To protect the beneficial uses of M-2 category waters, EPA proposes a MDL and AML of 104 CFU/100 mL and 35 CFU/100 mL, respectively, for enterococci in the draft permit.
- i. Compliance with Federal Anti-Backsliding Provisions and Guam's Antidegradation Policy for Proposed WQBELS.** Section 402(o) of the CWA prohibits the renewal or reissuance of an NPDES permit that contains WQBELS less stringent than those established in the previous permit, except as provided in the statute. This is referred to as "anti-backsliding." The draft permit proposes numeric WQBELS for enterococci and aluminum that are less stringent than those in the existing permit. For enterococci, the MDEL in the existing permit is 57 cfu/100mL; the proposed permit limit is 104 CFU/100 mL. The proposed MDL is based on current Guam water quality standards. The AML/MDEL for aluminum in the existing permit are, respectively, 120 and 200 µg/L; the calculated permit limits are 148 and 362 µg/L. The calculate permit limits are derived from current monitoring data, Guam water quality standards and EPA's *Technical Support Document for Water Quality-based Toxics Control* (TSD, March 1991) and based on statistical procedures outlined in section 5.4.1 and 5.4.4 of EPA's TSD, expressed as a Maximum Daily Effluent Limitation (MDEL) or Average Monthly Limitation (AML). Despite increased permit limits, these limits are considered backsliding and less stringent than the existing permit limits, therefore, the current permit limits applied.

PART V - DETERMINATION OF NARRATIVE WATER QUALITY-BASED EFFLUENT LIMITS

Section 5103 of GWQS contains narrative water quality standards that apply to all waters of Guam. The draft permit establishes the following narrative water quality-based effluent limits:

- A. The discharge shall be free from substances, conditions or combinations that cause visible floating materials, debris, oil, grease, scum, foam, and other floating material which degrades water quality or use. [GWQS 5103.A.1.a]
- B. The discharge shall be free from substances, conditions or combinations that produce visible turbidity, settle to form deposits or otherwise adversely affect aquatic life. [GWQS 5103.A.1.b]
- C. The discharge shall be free from substances, conditions or combinations that produce objectionable color, odor or taste, directly or by chemical or biological action. [GWQS 5103.A.1.c]
- D. The discharge shall be free from substances, conditions or combinations that injure or are toxic or harmful to humans, animals, plants or aquatic life. [GWQS 5103.A.1.d]
- E. The discharge shall be free from substances, conditions or combinations that injure or are toxic or harmful to humans, animals, plants or aquatic life. [GWQS 5103.A.1.e]
- F. The discharge shall not cause the pH to change more than 0.2 units from the naturally occurring variation, or in any case outside the range of 6.5 to 8.5 standard units. [GWQS 5103.C.2.iii]
- G. The discharge shall not cause orthophosphate concentration in the receiving waters to exceed 0.05 mg/L. [GWQS 5103.C.3.a]
- H. The discharge shall not cause nitrate-nitrogen concentration to exceed 0.2 mg/L. [GWQS 5103.C.3.b]

Table 9 - Proposed Effluent Limitations and Monitoring, Monitoring Frequency, and Sample Type for Each Pollutant or Parameter for Discharge Outfall No. 001 for the Agat-Santa Rita WWTP.

Parameter	Units ¹	Existing Permit Effluent Limitations			Draft Permit Effluent Limitations			Monitoring Requirements	
		Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Monitoring Frequency	Sample Type
Flow Rate	MGD	-- ²	--	--	0.75	--	--	Continuous	Metered
Biological Oxygen Demand	mg/L	30	45	--	30	45	--	Weekly	24-hr Composite
	lbs/day	375	563	--	127.8	281.5	--		
	Both the influent and the effluent shall be monitored. The arithmetic mean of the BOD values, by concentration, for effluent samples collected over a calendar month shall not exceed 15 percent of the arithmetic mean, by concentration, for influent samples collected at approximately the same times during the same period. The 30-day average percent removal shall not be less than 85 percent.								
Total Suspended Solids	mg/L	30	45	--	30	45	--	Weekly	24-hr Composite
	lbs/day	375	563	--	127.8	281.5	--		
	Both the influent and the effluent shall be monitored. The arithmetic mean of the TSS values, by concentration, for effluent samples collected over a calendar month shall not exceed 15 percent of the arithmetic mean, by concentration, for influent samples collected at approximately the same times during the same period. The 30-day average percent removal shall not be less than 85 percent.								
Fecal coliform ³	CFU/100mL	200	400	--	200	400	--	Weekly	Discrete
Total Chlorine Residual ⁴	µg/L	7.5	--	12.3	7.5	--	12.3	Weekly	Discrete
	lbs/day	0.094	--	0.154	0.05	--	0.08		
pH	Std. Units	Not < 6.0 or > 9.0 SU at any time.			Not < 6.5 or > 8.5 SU at any time			Weekly	Discrete
Enterococci	CFU/100mL	35	--	57	35	--	104	Weekly	Discrete
Copper, total recoverable	µg/L	2.9	--	4.8	2.2	--	4.79	Monthly	24-hr Composite
	lbs/day	0.037	--	0.060	0.014	--	0.030		
Nickel, total recoverable	µg/L	8.2	--	13	8.2	--	13	Monthly	24-hr Composite
	lbs/day	0.103	--	0.169	0.051	--	0.081		

Table 9 Continued - Proposed Effluent Limitations and Monitoring, Monitoring Frequency, and Sample Type for Each Pollutant or Parameter for Discharge Outfall No. 001 for the Agat-Santa Rita WWTP.

Parameter	Units ¹	Existing Permit Effluent Limitations			Draft Permit Effluent Limitations			Monitoring Requirements	
		Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Monitoring Frequency	Sample Type
Zinc, total recoverable	µg/L	58	--	95	45.8	--	95.0	Monthly	24-hr Composite
	lbs/day	0.724	--	1.19	0.29	--	0.59		
Aluminum, total recoverable	µg/L	120	--	200	120	--	200	Monthly	24-hr Composite
	lbs/day	1.52	--	2.50	0.75	--	1.25		
Other Heavy Metals ⁵	µg/L	Monitoring Only	--	Monitoring Only	--	--	Monitoring Only	1x/permit term	24-hr Composite
	lbs/day	--	--	--	--	--	--		
4,4-DDE	µg/L	Monitoring Only	--	Monitoring Only	--	--	--	Quarterly	24-hr Composite
4,4-DDD	µg/L	Monitoring Only	--	Monitoring Only	--	--	--	Quarterly	24-hr Composite
Chlordane	µg/L	Monitoring Only	--	Monitoring Only	0.182	--	0.320	Monthly	24-hr Composite
	lbs/day	--	--	--	1.14×10^{-3}	--	2.00×10^{-3}		
Dieldrin	µg/L	Monitoring Only	--	Monitoring Only	--	--	--	Quarterly	24-hr Composite
Pesticides ⁶	µg/L or mg/L	Monitoring Only	--	Monitoring Only	--	--	Monitoring Only	1x/permit term	24-hr Composite
Total Ammonia (as NH ₃ + NH ₄ ⁺)	mg/L	Monitoring Only	--	Monitoring Only	Monitoring Only	--	Monitoring Only	Monthly	24-hr Composite
Oil and Grease	mg/L	Monitoring Only	--	Monitoring Only	10	--	15	Monthly	Grab
	lbs/day	--	--	--	62.6	--	93.8		

Table 9 Continued - Proposed Effluent Limitations and Monitoring, Monitoring Frequency, and Sample Type for Each Pollutant or Parameter for Discharge Outfall No. 001 for the Agat-Santa Rita WWTP.

Parameter	Units ¹	Existing Permit Effluent Limitations			Draft Permit Effluent Limitations			Monitoring Requirements	
		Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Monitoring Frequency	Sample Type
Chronic Whole Effluent Toxicity	TU _c	Monitoring Only	--	Monitoring Only	138	--	69	Quarterly	24-hr Composite

¹ Mass effluent limitations based on a design flow of 0.75 MGD

² Not applicable or data not available for review

³ Fecal coliform effluent limitation and effluent monitoring requirement is effective upon implementation of a disinfection system

⁴ Total Residual Chlorine effluent limitation and effluent monitoring requirement is effective upon implementation of a disinfection system using chlorination; the permittee is required to notify EPA and GEPA 30 days prior to operation of a disinfection system

⁵ Heavy metals mean: As, Cd, Cr³⁺, Cr⁶⁺, Cu, Hg, Pb, Ni, Ag, and Zn; both total recoverable and dissolved metal concentrations shall be reported

⁶ For a listing of all pesticides (organochlorines, organophosphates, carbamates, herbicides, fungicides, defoliants, and botanicals) see USEPA Water Quality Criteria *Blue Book*.

- I. The discharge shall not cause unionized ammonia concentration to exceed 0.02 mg/L. [GWQS Appendix A. Table IV]
- J. The discharge shall not cause the concentration of DO in the receiving water to be less than 75% of saturation. [GWQS 5103.C.4]
- K. The discharge shall not cause alterations of the marine environment that would alter the salinity of marine or estuarine waters and wetlands of Guam more than +10% of the ambient conditions, except when due to natural conditions. [GWQS 5103.C.5.a]
- L. The discharge shall not cause total non-filterable suspended matter any any point to be increased more than 10% from ambient at any time , and the total concentration should not exceed 20 mg/L, except when due to natural conditions. [GWQS 5103.C.6.b]
- M. The discharge shall not cause the turbidity in the receiving water to exceed 1.0 NTU over ambient conditions, except when due to natural causes. [GWQS 5103.C.7.b]
- N. The discharge of any radioactive wastes and contaminated radioactive materials from research facilities is strictly prohibited. [GWQS 5103.C.8]
- O. The discharge shall not cause the temperature in the receiving water to deviate more than 1.0 degree Centigrade (1.8 of the degree Fahrenheit) from ambient conditions. [GWQS 5103.C.9]
- P. The discharge shall not cause the concentration of oil or petroleum products in the receiving waters to cause: 1) a visible film, or sheen, or results in visible discoloration of the surface with a corresponding oil or petroleum product odor, or 2) damage to fish or invertebrates, or 3) an oil deposit on the shore or bottom. [GWQS 5103.C.10]
- Q. The discharge shall not cause concentrations of toxic substances in the receiving waters that produce detrimental physiological, acute or chronic responses in human, plant, animal or aquatic life. [GWQS 5103.C.11.a.i]
- R. The discharge shall not cause concentrations of toxic substances in the receiving waters that produce contamination in harvestable aquatic life to the extent that it causes detrimental physiological, acute or chronic responses in humans or protected wildlife, when consumed. [GWQS 5103.C.11.a.ii]
- S. The discharge shall not cause concentrations of toxic substances in the receiving waters that result in the survival of aquatic life subject to the discharge to be less than that for the same water body in areas unaffected by the discharge. [GWQS 5103.C.11.a.iii]
- T. Whenever natural concentrations of any toxic substance shall occur and exceed the limits established in these standards, this greater concentration shall constitute the limit, provided that this natural concentration was not directly affected by human-induced causes. [GWQS 5103.C.11.a.iv]

PART VI - MONITORING AND REPORTING REQUIREMENTS

The draft permit requires the permittee to continue to monitor for pollutants or parameters in the effluent with technology-based effluent limits and water quality-based effluent limits for the duration of the permit term.

A. Influent Monitoring and Reporting

The permittee shall conduct influent monitoring to evaluate compliance with the draft permit conditions. The permittee shall perform all monitoring, sampling and analyses in accordance with the methods described in the most recent edition of 40 CFR 136, unless otherwise specified in the draft permit. All influent monitoring data shall be reported on monthly DMR forms and submitted quarterly to EPA and GEPA, as specified in the draft permit.

B. Effluent Monitoring and Reporting

The permittee shall conduct effluent monitoring to evaluate compliance with the draft permit conditions. The permittee shall perform all monitoring, sampling and analyses in accordance with the methods described in the most recent edition of 40 CFR 136, unless otherwise specified in the draft permit. All effluent monitoring data shall be reported on monthly DMR forms and submitted quarterly to EPA and GEPA, as specified in the draft permit.

C. Whole Effluent Toxicity Monitoring and Reporting

For compliance with narrative GWQS for toxicity, the draft permit requires the permittee to conduct whole effluent toxicity monitoring to determine whether the effluent is contributing chronic toxicity to the receiving water. The draft permit also requires that if effluent toxicity is observed, the permittee must investigate the causes of, and identify corrective actions to reduce or eliminate any observed effluent toxicity.

Monitoring Frequency. The permittee shall conduct quarterly chronic toxicity tests on 24-hour composite effluent samples¹. The chronic toxicity test sample shall be collected at the designated NPDES sampling station for the effluent, i.e., downstream from the last treatment process and any in-plant return flows where a representative effluent sample can be obtained. During each year of the permit term, a split of one toxicity test sample shall be analyzed for all other monitored parameters at the minimum frequency of analysis specified by the effluent monitoring program.

Estuarine/Marine Species and Test Methods. Species and short-term test methods for estimating the chronic toxicity of NPDES effluents are found in *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms* (EPA, 1995) and *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms*

¹The permittee shall attempt to ensure a total holding time from collection of the last portion of the composite sample until arrival at the laboratory of not more than 36 hours. Should longer than a 36-hour holding time be anticipated, the permittee shall petition EPA Region IX for an extension of the holding time. The extended holding time shall not exceed 72 hours.

(EPA/821/R-02/014; 2002). The permittee shall conduct chronic toxicity tests with the sea urchin, *Strongylocentrotus purpuratus* (fertilization test method 1008.0)

Toxicity Limits. For this discharge, EPA proposes numeric effluent limitations. DMR data from December 2005 to December 2008 indicate that whole effluent toxicity (WET) does present a reasonable potential for water quality excursions. EPA proposes that the permittee monitors WET and the draft permit includes toxicity limits that, if exceeded, require additional, accelerated toxicity testing (see Part VIII.E, below). For this discharge, the existing mixing zone allowance is applied for chronic toxicity. The dilution credit of 82:1 is applied to the draft permit.

WET test results shall be reported in TU_c , where $TU_c = 100/NOEC$ (No Observed Effect Concentration). NOEC is the highest concentration of toxicant to which organisms are exposed that causes no observable adverse effects on the test organisms. For this discharge, the chronic WET limits are any one test result greater than 1.6 TU_c (during the monthly reporting period), or any one or more test results with a calculated average value greater than 1.0 TU_c (during the monthly reporting period). Since EPA applied the dilution allowance of 82:1, EPA derived the maximum daily and average monthly limits as 69 and 138 TU_c , respectively.

Chronic Toxicity Reporting and Quality Assurance. All toxicity monitoring data shall be reported on monthly DMR forms and submitted with quality assurance measures, instructions, and other recommendations and requirements are found in the test methods manual previously referenced. Additional requirements that address dilution and control water quality, reference toxicant testing, test results review and reporting, within-test variability, and chlorinated effluents are included in the draft permit.

D. Priority Toxic Pollutants Scan

In accordance with federal regulations, the permittee shall conduct Priority Toxics Pollutants scans during the fourth year of the five-year permit term to ensure that the discharge does not contain toxic pollutants in concentrations that may cause a violation of water quality standards. The permittee shall perform all effluent sampling and analyses for the priority pollutants scan in accordance with the methods described in the most recent edition of 40 CFR 136, unless otherwise specified in the draft permit or EPA. 40 CFR 131.36 provides a complete list of Priority Toxic Pollutants.

PART VII - STANDARD CONDITIONS

A. MODIFICATION OR REVOCATION AND REISSUANCE PROVISIONS

1. In accordance with 40 CFR 122.62, 122.63 and 124.5, this permit may be modified by EPA to include effluent limits, monitoring, or other conditions to implement new regulations, including EPA-approved water quality standards; or to address new information indicating reasonable potential for the discharge to cause or contribute to exceedances of water quality standards.
2. In accordance with 40 CFR 122.62, 122.63 and 124.5, the draft permit may be modified to include effluent limitations or permit conditions to address chronic

toxicity in the effluent or receiving water body, as a result of the discharge; or implement new, revised, or newly interpreted water quality standards applicable to chronic toxicity.

3. In accordance with 40 CFR 122.62, 122.63 and 124.5, the draft permit may be modified to include effluent limitations or permit conditions when other new information is provided to EPA; such as, but not limited to, an approved mixing zone for specified pollutants by Guam EPA.

B. Standard Provisions

The draft permit requires the permittee to comply with EPA Region IX Standard Federal NPDES Permit Conditions, dated July 1, 2001.

PART VIII - SPECIAL CONDITIONS

A. Biosolids Requirements

Pursuant to 40 CFR 503, standard requirements for the monitoring, reporting, recordkeeping, and handling of biosolids are proposed for the draft permit. "Biosolids" means non-hazardous sewage sludge, as defined in 40 CFR 503.9. Sewage sludge that is hazardous, as defined in 40 CFR 261, must be disposed of in accordance with the Resource Conservation and Recovery Act. Biosolids permit provisions address: General Requirements, Inspection and Entry, Monitoring, Pathogen and Vector Control, Surface Disposal, Landfill Disposal, and Notification and Reporting

B. Development and Implementation of Best Management Practices

The draft permit requires the permittee to develop and implement appropriate pollution prevention measures or Best Management Practices (BMPs) designed to control site runoff, spillage or leaks, sludge or waste disposal, and drainage from collection system, storage/supply, and treatment/operational/process areas that may contribute pollutants to surface waters within 90 days from the effective date of this permit (section 304(e) of the CWA and 40 CFR 122.44(k)). BMPs shall include but are not limited to those necessary to control TSS and oil and grease. Through the implementation of BMPs described in a BMP Plan, the permittee shall prevent or minimize the generation and discharge of wastes and pollutants from the facility to waters of the U.S. The BMP plan shall be located at the facility and be made available upon request by EPA and/or GEPA.

C. Development and Implementation of a Toxic Pollutant Minimization Program

The draft permit contains provisions to monitor for heavy metals and pesticides once every permit cycle. The permittee shall review the analytical results from the first year of effluent monitoring and compare these results to their respective, applicable acute aquatic, chronic aquatic and human health water quality standards. If analytical results are obtained equal to or greater than the most stringent water quality standard, the permittee shall develop and implement a toxic pollutant minimization program no later than the end of the second year of coverage under the final permit. The permittee shall make every effort to identify the sources of these pollutants within the facility and

develop a program to minimize their entry into the facility's wastewater and subsequent discharge to the receiving water. The goal of the toxic pollutant minimization program shall be for the discharge to achieve GWQS as soon as practicable.

D. Development and Implementation of the Tupalao Bay of the Philippine Sea Receiving Water Monitoring Program

The draft permit requires the permittee to develop and implement a Tupalao Bay receiving water monitoring program. Ambient water and sediment monitoring is required to determine compliance with narrative water quality-based effluent limitations and to characterize the general quality of the receiving water. Monitoring locations, requirements, and frequencies have been retained from the existing permit. The permittee shall conduct the following receiving water monitoring program.

The rationale for retaining the receiving water monitoring program in the draft permit is based on ability of this facility to discharge effluent to the Tupalao Bay of the Philippine Sea and performance of the Agat-Santa Rita WWTP from 2005 to 2008:

- Fecal coliform and enterococci levels were noncompliant for all reported discharges, typically from one to more than three orders of magnitude above permit limits because disinfection is not performed on the effluent;
- Although BOD and TSS performance has improved, percentage removals are still far below the 85% target set in the permit; and
- Copper, zinc, and aluminum are consistently above permit limits, with mean effluent concentrations approximately ten-folds greater than permit limits for copper and aluminum and 2- to 3-fold greater than permit limits for zinc.

Based on DMR data for the period from January 2005 to December 2008 the Agat Santa-Rita WWTP was essentially out of compliance with the NPDES permit requirements a majority of time during the reporting period. All of the effluent discharge parameters, except for pH, exceeded the maximum limits established in the NPDES permit, including 5-day biochemical oxygen demand (BOD₅), total suspended solids (TSS), fecal coliform, and enterococci

Monitoring Locations. The existing permit established receiving water monitoring at the surface water stations whose locations are described in Table 10, and are retained in the draft permit. The permittee shall verify all station locations (latitude and longitude) and depths during the first sampling survey and submit this information with the first quarterly receiving water monitoring report to EPA Region IX and GEPA.

Table 10 - Description of Shoreline and Offshore Ambient Water Monitoring Station Locations in Tupalao Bay of the Philippine Sea.¹

Shoreline Station Name	Location
Tipalao Shore A (TS1)	On either side of the cove, near the shoreline
Tipalao Shore B (TS2)	Directly shoreward of the outfall diffuser
Tipalao Shore C (TS3; control station)	1,000 meters southeast of the diffuser, near the shoreline
Offshore Station Name	Location
Tipalao Bay A (TB1)	120 - 130 feet south of Discharge Serial No. 001
Tipalao Bay B (TB2)	120 -130 feet north of Discharge Serial No. 001
Tipalao Bay C (TB3; control station)	At least 1,000 meters southeast of Discharge Serial No. 001, or outside of Tipalao Bay

¹ Attachment D provides a map of the facility and monitoring station locations.

Monitoring Requirements. The water quality monitoring requirements of the receiving water monitoring program that are in the existing permit are retained in the draft permit and provided in Table 11. Sediment monitoring requirements that are in the existing permit are also retained in the draft permit and provided in Table 12.

Monitoring Frequency. The draft permit requires the permittee to submit quarterly receiving water monitoring reports to EPA and GEPA by 28th of April, July, October, and January for each period covering the previous three calendar months. At a minimum, these reports shall include:

1. A description of all station locations with verified latitude and longitude coordinates submitted with the first quarterly receiving water report.
2. A description of climatic and receiving water characteristics at the time of sampling (*e.g.*, weather observations, floating debris, discoloration, time of sampling, tide, *etc.*);
3. A description of the sample collection and preservation procedures used in the receiving water monitoring program;
4. Description of the specific method used for laboratory analysis; and
5. An in-depth discussion of the results of the receiving water monitoring program.

E. Development of an Initial Investigation TRE Workplan

The draft permit requires the permittee to develop and implement a Toxics Reduction Evaluation (TRE) Workplan in the event of unacceptable effluent toxicity. For chronic toxicity, effluent toxicity permit limit is found for any monthly chronic toxicity test results with a calculated maximum daily limit value greater than 69 TU_c or any average monthly chronic toxicity test result of 138 TU_c. The draft permit requires additional toxicity testing if a chronic toxicity monitoring limit is exceeded.

Within 90 days of the permit effective date, the permittee shall prepare and submit a copy of their Initial Investigation Toxicity Reduction Evaluation (TRE) Workplan (1-2 pages)

to the permitting authority for review. This plan shall include steps the permittee intends to follow if toxicity is measured above a chronic WET permit limit or trigger and should include, at minimum:

1. A description of the investigation and evaluation techniques that would be used to identify potential causes and sources of toxicity, effluent variability, and treatment system efficiency;
2. A description of methods for maximizing in-house treatment system efficiency, good housekeeping practices, and a list of all chemicals used in operations at the facility; and
3. If a Toxicity Identification Evaluation (TIE) is necessary, an indication of who would conduct the TIEs (i.e., an in-house expert or outside contractor).

Table 11 - Summary of Shoreline and Offshore Ambient Water Monitoring Requirements

Receiving Water Characteristic	Units	Monitoring Frequency	Sample Type
Shoreline Monitoring			
Visual Observations ¹	Visual	Monthly	Visual
Enterococci	CFU/100 mL	Monthly	Surface Grab
Nitrate-Nitrogen	mg-N/L	Monthly	Surface Grab
Ammonia Nitrogen	mg-N/L	Monthly	Surface Grab
Total Phosphorus	mg-P/L	Monthly	Surface Grab
Offshore Monitoring			
Enterococci	CFU/100 mL	Monthly	Surface, mid-depth, bottom grab
Orthophosphate (PO ₄ -P)	mg/L	Quarterly	Surface, mid-depth, bottom grab
Nitrate-Nitrogen (NO ₃ -N)	mg/L	Quarterly	Surface, mid-depth, bottom grab
Ammonia	µg/L	Quarterly	Surface, mid-depth, bottom grab
Turbidity	NTU	Quarterly	Nephelometer
Suspended Solids	mg/L	Quarterly	Surface, mid-depth, bottom grab
Copper	µg/L	Monthly	Surface, mid-depth, bottom grab
Aluminum	µg/L	Monthly	Surface, mid-depth, bottom grab
Nickel	µg/L	Monthly	Surface, mid-depth, bottom grab
Zinc	µg/L	Monthly	Surface, mid-depth, bottom

Receiving Water Characteristic	Units	Monitoring Frequency	Sample Type
			grab
Others (Mg, Pb, Ag, Fe, Hg, CN)	µg/L	Quarterly	Surface, mid-depth, bottom grab
Oil and Grease	Visual Observations	Monthly	Surface Grab
pH	Standard Units	Quarterly	CDP ²
Dissolved Oxygen	mg/L	Quarterly	CDP ²

¹Visual Observations shall include the following: floating material (oils, grease, scum, etc.), odor, and color

²Continuous depth profile (CDP) is a plot of depth versus water quality parameter. The maximum interval between points on the curve shall be 2 m.

F. Accelerated Toxicity Testing and TRE/TIE Process

1. If a chronic WET permit limit or trigger is exceeded and the source of toxicity is known (e.g., a temporary plant upset), then the permittee shall conduct one additional toxicity test using the same species and test method. This test shall begin within 14 days of receipt of test results exceeding a chronic WET permit limit or trigger. If the additional toxicity test does not exceed a chronic WET permit limit or trigger, then the permittee may return to their regular testing frequency.
2. If a chronic WET permit limit or trigger is exceeded and the source of toxicity is not known, then the permittee shall conduct six additional toxicity tests using the same species and test method, approximately every two weeks, over a 12 week period. This testing shall begin within 14 days of receipt of test results exceeding a chronic WET permit limit or trigger. If none of the additional toxicity tests exceed a chronic WET permit limit or trigger, then the permittee may return to their regular testing frequency.
3. If one of the additional toxicity tests (in paragraphs F.1 or F.2) exceeds a chronic WET permit limit or trigger, then, within 14 days of receipt of this test result, the permittee shall initiate a TRE using as guidance, based on the type of treatment facility, EPA manuals *Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants* (EPA, 1999) or *Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations* (EPA, 1989b). In conjunction, the permittee shall develop and implement a detailed TRE workplan which shall include: further actions undertaken by the permittee to investigate, identify, and correct the causes of toxicity; actions the permittee will take to mitigate the impact of the discharge and prevent the recurrence of toxicity; and a schedule for these actions.
4. The permittee may initiate a Toxicity Identification Evaluation (TIE) as part of a TRE to identify the causes of toxicity using the same species and test method and, as guidance, EPA test method manuals: *Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I* (EPA, 1992); *Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA, 1993a); and

Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity (EPA, 1993b).

PART IX - OTHER CONSIDERATIONS UNDER FEDERAL LAW

A. Impact to Threatened and Endangered Species

Section 7 of the Endangered Species Act of 1973 (16 U.S.C. § 1536) requires federal agencies to ensure that any action authorized, funded, or carried out by the federal agency does not jeopardize the continued existence of a listed or candidate species, or result in the destruction or adverse modification of its habitat. The Tupalao Bay of the Philippine Sea is considered marine waters used for propagation and survival of marine life, mariculture, whole body contact recreation, and aesthetic enjoyment and related activities. On May 22, 2008, EPA requested informal consultation with the U.S. Fish and Wildlife Service and National Marine Fisheries Service (collectively referred to as the Services) to identify any federally listed, proposed and candidate endangered or threatened species and designated and proposed critical habitats that occur in the Tupalao Bay of the Philippine Sea or in the vicinity of the effluent discharge. To date, EPA has not received any information on from the Services on ESA-listed species or habitat that occur near the discharge site. At the time this information is received, EPA will review the information and make a determination prior to issuance of the final permit whether any listed species are affected by the discharge.

B. Impact to Coastal Zones

The Coastal Zone Management Act (CZMA) requires that federal activities and licenses, including federally permitted activities, must be consistent with an approved state Coastal Management Plan (CZMA Sections 307(c)(1) through (3)). Section 307(c) of the CZMA and implementing regulations at 40 CFR 930 prohibit EPA from issuing a permit for an activity affecting land or water use in the coastal zone until the applicant certifies that the proposed activity complies with the State (or Territory) Coastal Zone Management program, and the State (or Territory) or its designated agency concurs with the certification. At this time, EPA has not received a consistency certification from the Guam Department of Commerce for the proposed Agat-Santa Rita WWTP discharge. At the time the certification is received, EPA will review the certification and will make any necessary modification to the draft permit to ensure compliance with the Guam Coastal Management Plan.

C. Impact to Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act (MSA) set forth a number of new mandates for the National Marine Fisheries Service, regional fishery management councils and other federal agencies to identify and protect important marine and anadromous fish species and habitat. The MSA requires Federal agencies to make a determination on federal actions that may adversely impact Essential Fish Habitat (EFH) in marine environments. Since Tupalao Bay of the Philippine Sea is considered a marine ecosystem, federal requirements of the MSA apply to EPA's proposed action to issue an NPDES permit to discharge in the Tupalao Bay of

the Philippine Sea. Therefore, EPA is required to make a determination on whether this action may adversely impact Essential Fish Habitat, as defined under the MSA. EPA has determined that reissuance of the NPDES permit for the Agat-Santa Rita WWTP Treatment Plant will not adversely affect impact Essential Fish Habitat, as defined under the MSA.

D. Clean Water Act Section 403 Marine Discharge Criteria

Section 403 of the CWA require that an NPDES permit for a discharge to into marine waters located seaward of the inner boundary of the territorial seas be issued in accordance with guidelines for determining the potential degradation of the marine environment. These guidelines, refereed to as the Ocean Discharge Criteria (40 CFR 125 Subpart M) and section 403 of the CWA are intended to "prevent unreasonable degradation of the marine environment and to authorize imposition of effluent limitations, including a prohibition of discharge, if necessary, to ensure this goal" (49 Federal Register 65942, October 3,, 1980).

If EPA determines that the discharge will cause unreasonable degradation, an NPDES permit will not be issued. If a determination of unreasonable degradation cannot be made because of a lack of sufficient information, EPA must then determine whether a discharge will cause irreparable harm to the marine environment and whether there are reasonable alternatives. To assess the probability of irreparable harm, EPA is required to make a determination that the discharger, operating under appropriate permit conditions, will not cause permanent and significant harm to the environment.

The Agat-Santa Rita WWTP receives and treats domestic wastewater. There are no known industrial discharges to this facility nor known or potential for discharges of bioaccumulative pollutants. The facility does not chlorinate or otherwise disinfect the effluent. In the event the facility chlorinates during the permit period, the draft permit proposes effluent limitations for total residual chlorine based on the protection of aquatic life. There is no evidence of limitations on recreational uses such as fishing or swimming or otherwise limitations on designated uses for Tipalao Bay. The draft permit requires the permittee to conduct WET monitoring to assess the chronic toxicity of the effluent. Therefore, at this time, EPA has determined that the draft permit will not cause permanent and significant harm to the environment.

E. Impact to National Historic Properties

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to consider the effect of their undertakings on historic properties either listed on, or eligible for listing on, the National Register of Historic Places. Pursuant to federal requirements of NHPA and 36 CFR 800.3(a)(1), EPA has determined that the draft permit does not have the potential to affect any historic or cultural properties.

PART X - ADMINISTRATIVE INFORMATION

A. Public Notice

In accordance with 40 CFR 124.10, the EPA Director shall give public notice that a proposed permit has been prepared under 40 CFR 124.6(d) by mailing a copy of the notice to the permit applicant and other federal and state agencies, and through publication of a notice in a daily or weekly newspaper within the area affected by the facility. The public notice shall allow at least 30 days for public comment on the proposed permit.

B. Public Comment Period

In accordance with 40 CFR 124.11 and 12, during the public comment period, any interested person may submit written comments on the proposed permit and may request a public hearing, if no hearing has already been scheduled. A request for public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. In accordance with 40 CFR 124.13, all persons must raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by the close of the public comment period.

Comments may be submitted either in person or mailed to:

Richard Remigio
EPA Region IX
NPDES Permits Office, WTR-5
75 Hawthorne Street
San Francisco, California 94105

Administrator
Guam EPA
P.O. Box 22439 GMF
Barrigada, GU 96921

Interested persons may obtain further information, including copies of the permit application, fact sheet, and proposed permit, by contacting Mr. Mike Lee at the EPA Region IX address listed above. Copies of the Administrative Record (other than those which EPA Region IX maintains as confidential) are available for public inspection between the hours of 8:00 a.m. and 4:30 p.m., Monday through Friday (excluding federal holidays).

C. Public Hearing

In accordance with 40 CFR 124.12, the EPA Director shall hold a public hearing whenever she finds, on the basis of requests, a significant degree of public interest in the draft permit. The Director may also hold a public hearing when, for instance, such a hearing might clarify one or more issues involved in the permit decision. Public notice of such hearing shall be given as specified in 40 CFR 124.10.

D. Territorial Certification

In accordance with 40 CFR 124.53, under section 401 of the CWA, EPA may not issue a permit until certification is granted or waived in accordance with that section by the State or Territory in which the discharge originates. Territorial certification under section 401 of the CWA shall be in writing and shall include the conditions necessary to assure compliance with referenced applicable provisions of sections 208(e), 301, 302, 303, 306,

and 307 of the CWA and appropriate requirements of Territory law. At this time, EPA has not received a section 401 certification from GEPA that the permittee's discharge is consistent with the protected uses of the Tupalao Bay as stated in the GWQS and the CWA. At the time the certification is received, EPA will review the certification and will make necessary modification to the draft permit to ensure compliance with the GWQS.

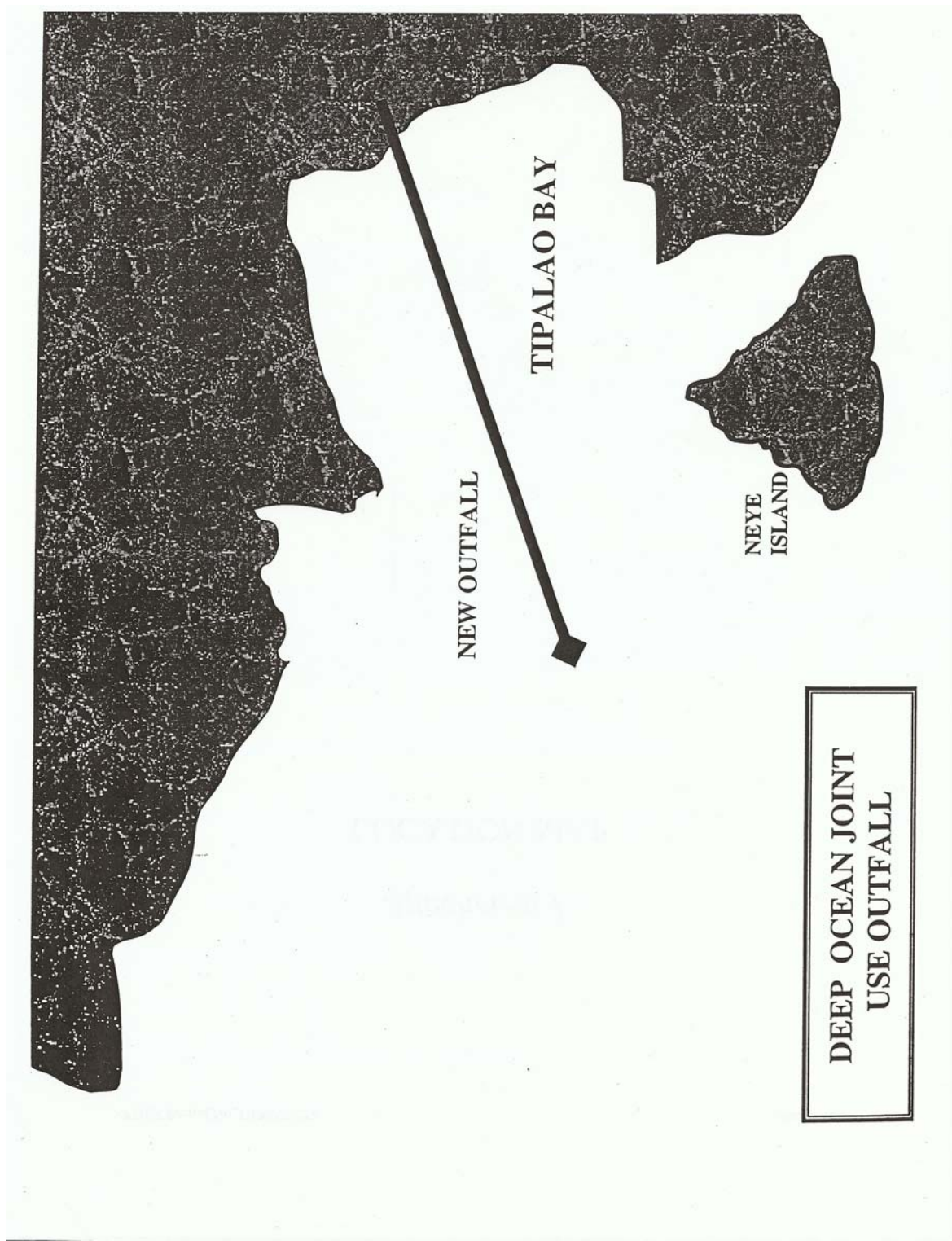
PART XI - REFERENCES

- Antweiler, R. and Taylor, R. 2008. Evaluation of Statistical Treatments of Left-Censored Environmental Data using Coincident Uncensored Data Sets: 1. Summary Statistics. Environmental Science and Technology. 42.10
- EPA. 1989. Ambient Water Quality Criteria for Ammonia (Saltwater) - 1989. Office of Water Regulations and Standards, Criteria and Standards Division, Washington, D.C., EPA/440/5-88-004.
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- EPA. 1991. Technical Support Document for Water Quality-based Toxics Control. Office of Water Enforcement and Permits, EPA. EPA/505/2-90-001.
- EPA. 1992. Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I. EPA/600/6-91/005F.
- EPA. 1993a. Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity. EPA/600/R-92/080.
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- EPA. 1995. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms. EPA/600/R-95/136.
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- EPA. 2002. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms. EPA/821/R-02/014.
- GEPA. 2002. Guam Water Quality Standards 2001 Revision.

PART XII - ATTACHMENTS

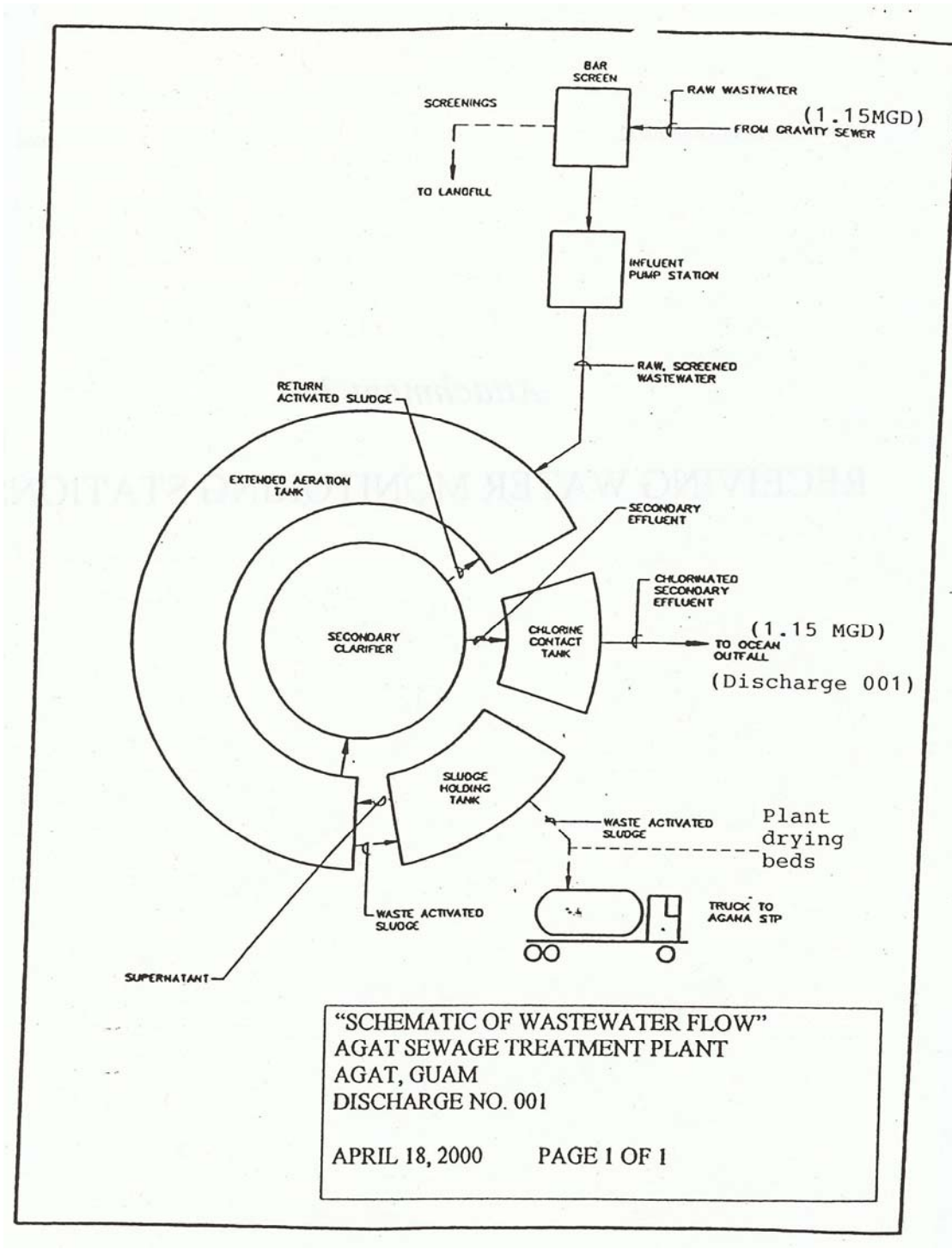
ATTACHMENT A

Location of the Agat-Santa Rita WWTP on Guam



ATTACHMENT B

Agat-Santa Rita Wastewater Treatment Process Flow



ATTACHMENT C

Calculations for Water Quality-Based Effluent Limitations

In accordance with EPA's Technical Support Document for Water Quality-Based Toxics Control ("TSD"), EPA calculated water quality-based effluent limitations for the draft permit using the following statistical procedures. Using chlordane as an example, the following demonstrates the procedure for developing water quality-based effluent limitations for NPDES permits.

Step 1: Determine the Waste Load Allocation. For each constituent requiring an effluent limit, identify the applicable water quality criteria. For each criterion, determine the effluent concentration or waste load allocation ("WLA") using the following steady state equation:

$$WLA = \frac{(C_r)(Q_r) + (C_a)(Q_a)}{Q_d}$$

Where: C_r = Applicable water quality criterion
 Q_r = Total Flow in receiving water
 C_a = Ambient Background Concentration
 Q_a = Ambient Background Flow
 Q_d = Flow of Discharge

For chlordane, the applicable water quality criterion for the protection of aquatic life and human health consumption and other parameters include the following,

$$\begin{aligned}C_{r_acute} &= 0.09 \mu\text{g/l} \\C_{r_chronic} &= 0.004 \mu\text{g/l} \\C_{r_human \text{ health-organism only (HHOO)}} &= 2.22 \times 10^{-3} \mu\text{g/l} \\D &= 82:1 \text{ (currently approved mixing zone)} \\C_a &= 0.0 \mu\text{g/l}.\end{aligned}$$

Based on the equation above, the WLA for aquatic life and human health are:

$$\begin{aligned}WLA_{acute} &= [(0.09 \mu\text{g/l}) (0.75 \text{ MGD}) + (0) (0) / (0.75 \text{ MGD})] * 82 = 7.38 \mu\text{g/L} \\WLA_{chronic} &= [(0.004 \mu\text{g/l}) (0.75 \text{ MGD}) + (0) (0) / (0.75 \text{ MGD})] * 82 = 0.328 \mu\text{g/L} \\WLA_{HHOO} &= [(2.22 \times 10^{-3} \mu\text{g/l}) (0.75 \text{ MGD}) + (0)(0) / 0.75 \text{ MGD}] * 82 = 0.182 \mu\text{g/L}\end{aligned}$$

Step 2: Determine the Long-Term Average. For each WLA based on aquatic life criterion, determine the long-term average discharge condition ("LTA") by multiplying the WLA by a WLA multiplier. The multiplier is a statistically-based factor that adjusts the WLA to account for effluent variability. The value of the multiplier varies depending on the coefficient of variation ("CV") of the data set and whether it is an acute or chronic criterion. Table 5-1 of EPA's TSD provides pre-calculated WLA multipliers based on the value of the CV and the probability basis (i.e., the 95th or 99th percentile level). As specified in the TSD, data sets of less than or equal to

10 samples, a CV of 0.6 is typical of the range of variability of effluents measured by EPA and represents a reasonable degree of relative variability. However for data sets of greater than 10 samples, the TSD describes appropriate statistical methods to use. Therefore, EPA calculated a CV of 1.88 for the chlordane data set and applied the 99th percentile as the probability basis.

For human health criterion, the TSD states that no LTA is calculated and recommends setting the WLA as an AML value. Thus, no WLA multiplier is required to determine a LTA for human health criterion.

$$LTA_{acute} = WLA_{acute} \times WLA \text{ multiplier}_{acute}$$

$$LTA_{chronic} = WLA_{chronic} \times WLA \text{ multiplier}_{chronic}$$

$$LTA_{HHOO} = \text{not applicable}$$

For chlordane, the following information was used to develop the LTA_{acute} and $LTA_{chronic}$ using Table 5-1 of the TSD.

$$WLA_{acute} = 7.38 \mu\text{g/L}$$

$$WLA_{chronic} = 0.328 \mu\text{g/L}$$

$$WLA_{HHOO} = 0.182 \mu\text{g/L}$$

$$WLA \text{ multiplier}_{acute} = 0.122$$

$$WLA \text{ multiplier}_{chronic} = 0.216$$

$$WLA \text{ multiplier}_{HHOO} = \text{Not applicable}$$

Thus,

$$LTA_{acute} = 7.38 \times 0.122 = 0.900 \mu\text{g/l}$$

$$LTA_{chronic} = 0.328 \times 0.216 = 7.08 \times 10^{-2} \mu\text{g/l}.$$

Step 3: Select the More Limiting Long-Term Average. Selecting the most limiting (lowest) LTA for chlordane-aquatic life, the most limiting LTA was the $LTA_{chronic}$.

Step 4. Determine the Concentration-Based Average Monthly and Maximum Daily Permit Limits for Aquatic Life. Water quality based effluent limits are expressed as an Average Monthly Limit ("AML") and Maximum Daily Limit ("MDL"). Calculate the water quality based effluent limits by multiplying the LTA by an AML and MDL multiplier:

$$AML = LTA_{AML} \times AML \text{ multiplier}$$

$$MDL = LTA_{MDL} \times MDL \text{ multiplier}.$$

The multiplier is a statistically based factor that adjusts the LTA for the averaging periods and exceedances frequencies of the criteria and the effluent limitation. The value of the multiplier varies depending on the probability, the CV, and for the AML only, the number of samples. Table 5-2 of the TSD provides pre-calculated AML and MDL multipliers. For limited data, the

TSD recommends the 95th percentile and $n = 4$ samples/month for the AML multiplier and the 99th occurrence probability for the MDL multiplier. For chlordane, the following equations were developed to determine the concentration-based AML and MDL for aquatic life using Table 5-2 of the TSD:

$$AML_{\text{concentration-chronic}} = 7.08 \times 10^{-2} \times 3.55 = 0.251 \mu\text{g/l}$$

$$MDL_{\text{concentration-chronic}} = 7.08 \times 10^{-2} \times 8.19 = 0.580 \mu\text{g/l}.$$

Step 6. Determine the Concentration-Based Average Monthly and Maximum Daily Permit Limits for Human Health.

Both aquatic life and human health criteria for chlordane are considered in determining the water quality-based effluent derivations. However, as described in the TSD, the permitting approach for human health is different than for aquatic life. For example, no LTA is calculated and the WLA concentration is set to the AML concentration for human health criterion. This approach ensures that the instream criteria will be met over the long-term. This approach considers the bioconcentration of pollutants in fish or shellfish tissue and consequently protects humans from the consumption of such exposed organisms.

To determine the MDL, the TSD recommends calculating the MDL based on the effluent variability (CV) and the number of monthly samples using Table 5-3 in the TSD.

$$AML_{\text{concentration-HHOO}} = WLA_{\text{HHOO}}$$

$$= 0.182 \mu\text{g/L}$$

$$MDL_{\text{concentration-HHOO}} = WLA_{\text{HHOO}} \times \text{MDL multiplier}$$

$$= 0.182 \times 1.76 = 0.320 \mu\text{g/l}.$$

Step 5. Select the More Limiting Average Monthly and Maximum Daily Permit Limits.

Upon comparing the human health-derived permit limit concentrations to the chronic aquatic life-derived permit limit concentrations, EPA determined that the human health-derived permit limit concentrations for the AML and MDL are more stringent.

Step 7. Determine the Mass-Based Average Monthly and Maximum Daily Permit Limits.

To determine the mass-based limitations for chlordane, calculate the mass limit based on the AML and MDL using the maximum design flow rate of 1.5 MGD and a standard unit conversion factor:

$$AML_{\text{mass}} = 0.182 \mu\text{g/l} \times 0.75 \text{ MGD} \times 0.00834 \text{ lbs L/} \mu\text{g MGD} = 1.14 \times 10^{-3} \text{ lbs/day}$$

$$MDL_{\text{mass}} = 0.320 \mu\text{g/l} \times 0.75 \text{ MGD} \times 0.00834 \text{ lbs L/} \mu\text{g MGD} = 2.00 \times 10^{-3} \text{ lbs/day}$$

ATTACHMENT D

Description of Tipalao Bay of the Philippine Sea Monitoring Program

